of the accidents reviewed. Finally, ways of improving postcrash survivability and accident and incident databases were proposed.

Using databases that captured the output of the accident analysis sessions, team members developed summary definitions of the types of Problems and Solutions found and nominated safety investments that should produce the greatest safety benefits. These represent the most promising Solutions grouped into research areas. The results of this helicopter accident analysis effort have been presented to industry and are available in a report.

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Simulation Motion Requirements in Coordinated Maneuvers

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If a pilot does not feel a lateral acceleration during a roll maneuver, the maneuver is said to be coordinated. During these maneuvers, the ball on the cockpit turn-and-slip indicator is centered. To accurately represent these coordinated maneuvers in a flight simulator, the motion platform must translate laterally when it rolls. However, most simulators do not have enough lateral displacement available to maintain coordination. As a result, the pilot feels an inappropriate, or false, lateral acceleration in the simulator. This study examined the effect of this false simulator cue. In addition, the effort suggested a criterion for simulator manufacturers and users that can be used to select the required size of future simulators. In the study, pilots flew a helicopter model in the world's largest displacement flight simulator, which is located at Ames Research Center. The large displacement of this unique simulator allowed coordinated maneuvers to be flown as a baseline. Subsequent reductions in the commanded roll and lateral simulator displacements allowed the examination of the false cueing effects. Measures of pilot-vehicle performance and pilot workload quantified the effect of these reductions in displacement.

The figure shows three fidelity regions superimposed on the percentage of full-roll motion versus the percentage of full-lateral motion. High fidelity means that the simulator motions felt like those of real flight. Medium fidelity means that the simulator motions were noticeably different from flight, but not objectionably so. Low fidelity means that the simulator motions were both noticeably different from those of flight and objectionable. Since medium fidelity is desired as a minimum, the criterion indicates that simulators should provide at least 20% of the full-roll motion and 40% of the full-lateral motion.

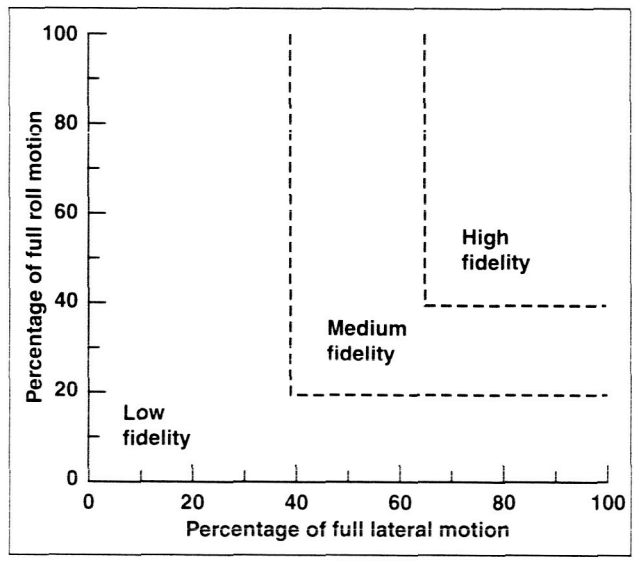

Fig. 1. Three fidelity regions superimposed on the percentage of full-roll motion versus the percentage of full-lateral motion.

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